Evaluation of novel formula of PSA, age, prostate volume, and race in predicting positive prostate biopsy findings.

Patel S, Issa MM, El-Galley R.
Division of Urology, Department of Surgery, University of Alabama at Birmingham School of Medicine, Birmingham, AL 35294-3411, USA.

Abstract

OBJECTIVE: To develop a formula that incorporates age, prostate volume, race, and prostate-specific antigen (PSA) level into a single score for prostate cancer detection.

MATERIALS AND METHODS: We developed a PSA-age volume (AV) score by multiplying the patient age by the prostate volume and dividing it by the PSA level. The PSA-AV was developed using 1000 prostate biopsy specimens and was validated on 318 internal and 4406 external biopsy specimens.

RESULTS: We analyzed 1000 biopsy specimens (mean age 63 ± 8 years, 63% white and 35% black, mean PSA 6.8 ± 4 ng/mL, mean prostate volume 41 ± 18 cm(3), mean PSA-AV 485 ± 304). Of the 1000 biopsy specimens, 556 (55.6%) had positive findings. A lower PSA-AV score correlated with a greater cancer risk (R² = 0.91). A PSA-AV score of 700 had a sensitivity and specificity of 87% and 35%, respectively. These values matched or exceeded the sensitivity and specificity for age-adjusted PSA level and a PSA cutoff of 4 ng/mL. Compared with using the age-adjusted PSA level, using a score of 700 increased the number of biopsies by 64 and detected 62 more cancers. Using a PSA-AV cutoff of 700, rather than a PSA cutoff of 4 ng/mL, led to 16 fewer biopsies with 7 additional cancers detected. Our data were internally and externally validated.

CONCLUSION: According to our data, a PSA-AV score has shown to be a useful formula for predicting positive biopsy findings. A PSA-AV score of 700 is useful in ruling out cancer in younger patients and patients with small prostates, and in ruling in cancer in older patients and patients with a large prostate.

Copyright © 2013 Elsevier Inc. All rights reserved.

PMID: 23312893 [PubMed - indexed for MEDLINE]